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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/915,911	07/26/2001	Yifan Gong	TI-30869	7358

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EXAMINER

CHAWAN, VIJAY B

ART UNIT

PAPER NUMBER

2626

DATE MAILED: 06/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/915,911

Applicant(s)

GONG, YIFAN

Examiner

Vijay B. Chawan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3,5-8 and 10-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3, 5-8, 10-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 5-8, 11, and 12-19 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 5-8, 11, and 12-19 define non-statutory processes because they merely manipulate an abstract idea (mathematical algorithm) without a claimed limitation to a practical application. The disclosed invention has a practical application in the technological arts (e.g recognizing speech); however, the claimed process, a series of steps to be performed on a computer, simply manipulates an abstract idea without a claimed limitation to the practical application and does not have any post or pre computer process activity.

The disclosed invention of speech recognition searching method for decoding multiple HMM sets using a generic base sentence network, is merely manipulation of mathematical data, with out steps reciting how speech is being recognized.

Applicant should note, however, that claims directed to speech or audio signal processing, would be considered to be statutory subject matter. For example, the requirement of the measurements of physical objects or activities to be transformed outside of the computer into computer data (In re Gelnovatch, 595 F.2d 32, 41 n.7,

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201 USPQ 136, 145 n.7 (CCPA 1979) (data- gathering step did not measure physical phenomenon); Arrhythmia, 958 F.2d at 1056, 22 USPQ2d at 1036), where the data comprises signals corresponding to physical objects or activities external to the computer system, and where the process causes a physical transformation of the signals which are intangible representations of the physical objects or activities.

Schrader, 22 F.3d at 294, 30 USPQ2d at 1459 citing with approval Arrhythmia, 958 F.2d at 1058-59, 22 USPQ2d at 1037-38; Abele, 684 F.2d at 909, 214 USPQ at 688; In re Taner, 681 F.2d 787, 790, 214 USPQ 678, 681 (CCPA 1982).

Examples of this type of claimed statutory process include the following:

- A method of using a computer processor to analyze electrical signals and data representative of human cardiac activity by converting the signals to time segments, applying the time segments in reverse order to a high pass filter means, using the computer processor to determine the amplitude of the high pass filter's output, and using the computer processor to compare the value to a predetermined value. In this example the data is an intangible representation of physical activity, i.e., human cardiac activity. The transformation occurs when heart activity is measured and an electrical signal is produced. This process has real world value in predicting vulnerability to ventricular tachycardia immediately after a heart attack.

- A method of using a computer processor to receive data representing Computerized Axial Tomography ("CAT") scan images of a patient, performing a calculation to determine the difference between a local value at a data point and an average value of the data in a region surrounding the point, and displaying the

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difference as a gray scale for each point in the image, and displaying the resulting image. In this example the data is an intangible representation of a physical object, i.e., portions of the anatomy of a patient. The transformation occurs when the condition of the human body is measured with X-rays and the X-rays are converted into electrical digital signals that represent the condition of the human body. The real world value of the invention lies in creating a new CAT scan image of body tissue without the presence of bones.

- A method of using a computer processor to conduct seismic exploration, by imparting spherical seismic energy waves into the earth from a seismic source, generating a plurality of reflected signals in response to the seismic energy waves at a set of receiver positions in an array, and summing the reflection signals to produce a signal simulating the reflection response of the earth to the seismic energy. In this example, the electrical signals processed by the computer represent reflected seismic energy. The transformation occurs by converting the spherical seismic energy waves into electrical signals which provide a geophysical representation of formations below the earth's surface. Geophysical exploration of formations below the surface of the earth has real world value.

Examples of claimed processes that independently limit the claimed invention to safe harbor include:

- a method of conducting seismic exploration which requires generating and manipulating signals from seismic energy waves before "summing" the values represented by the signals (Taner, 681 F.2d at 788, 214 USPQ at 679); and

- a method of displaying X-ray attenuation data as a signed gray scale signal in a "field" using a particular algorithm, where the antecedent steps require generating the data using a particular machine (e.g., a computer tomography scanner). Abele, 684 F.2d at 908, 214 USPQ at 687 ("The specification indicates that such attenuation data is available only when an X-ray beam is produced by a CAT scanner, passed through an object, and detected upon its exit. Only after these steps have been completed is the algorithm performed, and the resultant modified data displayed in the required format.").

Examples of claimed processes that do not limit the claimed invention to pre-computing safe harbor include:

- "perturbing" the values of a set of process inputs, where the subject matter "perturbed" was a number and the act of "perturbing" consists of substituting the numerical values of variables (Gelnovatch, 595 F.2d at 41 n.7, 201 USPQ at 145 n.7 ("Appellants' claimed step of perturbing the values of a set of process inputs (step 3), in addition to being a mathematical operation, appears to be a data-gathering step of the type we have held insufficient to change a nonstatutory method of calculation into a statutory process.... In this instance, the perturbed process inputs are not even measured values of physical phenomena, but are instead derived by numerically changing the values in the previous set of process inputs.")); and, selecting a set of arbitrary measurement point values (Sarkar, 588 F.2d at 1331, 200 USPQ at 135). If a claim does not clearly fall into one or both of the safe harbors, the claim may still be statutory if it is limited to a practical application in the technological arts.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 3, 5, 12-16, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Neumeyer et al., (6,226,611).

As per claim 3, Neumeyer et al., teach a speech recognizer for decoding multiple HMM sets using a generic base sentence network comprising:

means for decoding HMM sets using the generic base sentence network and a recognizer recognizing speech using said decoded multiple HMM sets, wherein the means for decoding includes means for building recognition paths defined on expanded symbols and accessing said network using base symbols through a conversion function that gives the base symbol of any expanded symbols, and vice versa (Col.10, lines 30-45, Neumeyer et al., teach or discuss a plurality, or sets of HMMs, i.e., a network. Col.10, line 53 – Col.11, line 54, Figure 4, of Neumeyer et al., shows sets of HMMs performing multiple duration calculations, therefore multiple sets, to find the correct acceptable path, especially in a sentence grammar structure, Col.1, lines 37-44).

As per claim 5, Neumeyer et al., teach a speech recognition search method for decoding multiple HMM sets using a generic base sentence network comprising: providing a generic grammars, providing expanded symbols representing a network of HMM sets and building recognition paths defined by the expanded symbols and accessing the generic base sentence network using base symbols through a proper conversion function that gives the base symbol of any expanded symbols, and vice versa ((Col.10, lines 30-45, Neumeyer et al., teach or discuss a plurality, or sets of HMMs, i.e., a network. Col.10, line 53 – Col.11, line 51, Figure 4, of Neumeyer et al., shows sets of HMMs performing multiple duration calculations, therefore multiple sets, to find the correct acceptable path, especially in a sentence grammar structure, Col.1, lines 37-44).

As per claim 7, Neumeyer et al., teach the method of claim 5, wherein said building step includes for each frame path propagation expansion within each expanded HMM set based on the grammar network and update-observation-probability (Col.10, line 53 – Col.11, line 51, Figure 4).

As per claim 8, Neumeyer et al., teach the method of claim 7, wherein said path propagation includes getting offsets that index each HMM set, retrieving individual expanded symbols for each HMM set that correspond to base symbols within the generic grammar network, and extending a Viterbi search for each expanded HMM set individually and separately by obtaining the HMM of the previous frame and expanding and storing a sequence set of HMM states both for within model path and cross model path and determining the path with the best transition probability (Col.11, lines 10-18).

As per claim 12, Neumeyer et al., teach a speech recognizer for decoding a plurality of model sets using a generic grammar network composed of base-symbols comprising: means for constructing recognition paths defined on expanded-symbols wherein each expanded-symbol references a model contained in one of the model sets, and means for determining expanded-symbols by a conversion function that maps a base-symbol of the generic base grammar network to a plurality of expanded-symbols and an expanded-symbol to its corresponding base-symbol (Col.10, lines 30-45, Neumeyer et al., teach or discuss a plurality, or sets of HMMs, i.e., a network. Col.10, line 53 – Col.11, line 54, Figure 4, of Neumeyer et al., shows sets of HMMs performing multiple duration calculations, therefore multiple sets, to find the correct acceptable path, especially in a sentence grammar structure, Col.1, lines 37-44).

As per claim 13, Neumeyer et al., teach the recognizer of claim 12, wherein said recognition path construction includes means for constraining each recognition path to expanded-symbols referencing models within one model set (Col.10, line 53 – Col.11, line 51, Figure 4).

As per claim 14, Neumeyer et al., teach the recognizer of claim 12, wherein the model sets are HMM models (Col.10, line 53 – Col.11, line 51, Figure 4).

As per claim 15, Neumeyer et al., teach the recognizer wherein the models of each set correspond to a single environmental factor (Col.10, line 53 – Col.11, line 51, Figure 4).

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As per claim 16, Neumeyer et al., teach the recognizer in claim 12, wherein the recognition procedure consists of a recognition path construction procedure and an update observation probability procedure (Col.10, line 53 – Col.11, line 51, Figure 4).

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by Naylor et al., (5,806,034).

As per claim 6, Naylor et al., teach a method of speech recognition for decoding multiple HMM sets using a generic base sentence network comprising the steps of:

providing a generic network containing base symbols(Col.3,lines 30-40, Fig.2, items 32,34, 36);

a plurality of sets of HMMs where each set of HMMs corresponds to a single environmental factor such as for male and female (Col.6, lines 15-25);

each said set of HMMs enumerated in terms of expanded symbols which map to the generic network base symbols (Fig.4);

accessing said generic network using said base symbols through a conversion function that gives base symbols for expanded symbols to therefore decode multiple HMM sets using a generic base sentence grammar and using said HMM sets to recognize incoming speech (Figs. 5-7, Col.8, lines 45-52, Col.7, lines 49-55).

Naylor teaches multiple sets of HMMs because of the separate use of male speakers to train the HMMs (Col.6, lines 15-25) leading one to naturally conclude that a separate set of trained HMMs (using the male speakers) is available along with a set of trained HMMs using a general population.

Response to Arguments

1. Applicant's arguments filed 3/31/06 have been fully considered but they are not persuasive.
2. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "distinction of sets of HMMs by "environment") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vijay B. Chawan whose telephone number is (571) 272-7601. The examiner can normally be reached on Monday Through Friday 6:30-3:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Vijay B. Chawan
Primary Examiner
Art Unit 2654

vbc
6/11/06

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PRIMARY EXAMINER